**Precalculus**

**Notes 3.3**

**Properties of Logarithms:**

1. then

**Use the properties of logarithms:**



**Properties of Natural Logarithms:**

1. If then

**Use the properties of Natural Logarithms:**

**Change of Base**

Change-of-Base Formula:

*Base b Base 10 Base e*

Examples – Changing Bases using Common Logs

Examples – Changing Bases using Natural Logs

**More Properties of Logarithms:**

Examples:

Solving logarithmic and exponential equations:



usually written